AIR TRANSPORT ASSOCIATION

March 11, 2005

The Honorable Ellen Engleman Conners
Chairman
National Transportation Safety Board
490 L'Enfant Plaza, SW
Washington, DC 20594

RE: NTSB NPRM concerning the Notification and Reporting of Aircraft Accidents or Incidents and Overdue Aircraft, and Preservation of Aircraft Wreckage, Mail, Cargo, and Records

National Transportation Safety Board
Proposed Revisions to 49 Code of Federal Regulations Part 830
69 Federal Register 77150 (December 27, 2004)

Dear Chairman Engleman Conners:

The Air Transport Association of America, Inc. (ATA), on behalf of its member airlines, appreciates the opportunity to submit these comments on proposed revisions to 49 CFR Part 830 significantly expanding the scope of occurrences subject to National Transportation Safety Board ("NTSB") notification requirements. The stated purpose of the revisions is to amend NTSB regulations entitled "Notification and Reporting of Aircraft Accidents or Incidents and Overdue Aircraft, and Preservation of Aircraft Wreckage, Mail, Cargo, and Records" to enhance aviation safety through the expanded notification, investigation and initiation of corrective action.

ATA members[1] carry more than 90% of U.S. airline passenger and cargo traffic, employing a fleet of more than 4,000 jet aircraft. We, therefore, welcome the critical role of the NTSB in ensuring that the United States maintains the safest air transport system in

[1] Members are: ABX Air, Alaska Airlines, Aloha Airlines, America West Airlines, American Airlines, ASTAR Air Cargo, ATA Airlines, Atlas Air, Continental Airlines, Delta Air Lines, Evergreen International Airlines, FedEx Corp., Hawaiian Airlines, JetBlue Airlines, Midwest Airlines, Northwest Airlines, Polar Air Cargo, Southwest Airlines, United Airlines, United Parcel Service Airways. Associate members are: Aerovias de Mexico, Air Canada, Air Jamaica, and Mexicana de Aviacion.

AIR TRANSPORT ASSOCIATION OF AMERICA, INC.
1301 PENNSYLVANIA AVENUE, NW SUITE 1100 WASHINGTON, DC 20004-1707
202.626.4000 www.airlines.org

the world. Our members share this commitment to safety and have long engaged in comprehensive mandatory and voluntary safety initiatives designed, in part, to capture hazardous occurrences. In addition to this joint commitment, the airlines are uniquely affected by this proposal as they implement and comply fully with all current NTSB occurrence reporting requirements in addition to the reporting components of multiple on-going safety data-sharing programs.

SUMMARY OF ATA'S POSITION

ATA and its members support the intent of the proposed expanded NTSB reporting requirements – identification of hazardous occurrences to facilitate safety investigations and corrective actions. We support inclusion of events involving the loss of information from aircraft primary displays, but recommend clarification as to the scope of reportable events. Due to the success of current safety data-sharing efforts that identify legitimate hazardous occurrences, we believe that the reporting to NTSB of certain internal turbine engine failures and **all** Traffic Collision Avoidance System ("TCAS") Resolution Advisories ("RAs") is neither necessary nor beneficial.

In addition, as part of NTSB's review of Part 830.5 reportable occurrences, we urge a review the current requirement that these additional (as well as existing) occurrences be reported to NTSB "immediately, and by the most expeditious means available" as the expanded reporting raises additional logistical, operational, and compliance issues for the airlines. Further, to maximize the benefits of safety data sharing programs, we urge NTSB to explore and take advantage of existing FAA event reporting requirements.

Our comments explain our concerns about the proposed requirements and recommend practical alternative approaches. As in the past, ATA and its members welcome the opportunity to participate in a process to address NTSB's desire to ensure that hazardous occurrences are reported appropriately and used to facilitate aviation safety enhancements.

COMMENTS ON SPECIFIC PROPOSED REQUIREMENTS

- **LOSS OF INFORMATION FROM AIRCRAFT PRIMARY DISPLAYS Proposed Part 830.5(c)**

While accommodating NTSB's desire to review this data, the proposed scope of reportable events relating to loss of aircraft display information is vague and overly broad. To mitigate the potential misinterpretation of the requirement, misreporting, and over reporting, we recommend a more objective delineation of the circumstances in which reporting is required.

The term "loss of information" should be defined as "an inability to simultaneously display two sources of attitude information and one source of navigational data (including primary and standby instruments), and basic engine instruments, without display

switching." This will reduce potential confusion arising from the abundance of generational digital flight data displays, often referred to as Electronic Flight Information Systems (EFIS), currently in use throughout the industry. In order to comply with this requirement, the airlines need clear guidance on the nature of the events NTSB intends to review.

In addition, the scope should be narrowed to cover only those events of interest to NTSB. We recommend inclusion of the term "airborne" at the beginning of the proposed new section: "(c) **Airborne** loss of information from a majority..." Otherwise, ground scenarios that do not constitute hazardous occurrences arguably must be reported. For instance, an aircraft that taxies to a de-icing pad, shuts down both engines for de-icing, and then suffers an unexpected loss of the Auxiliary Power Unit (APU), would incur a reportable event. Reporting of these events does not reflect the intent of the NTSB reporting scheme and will clutter the data pool.

- **INTERNAL TURBINE ENGINE FAILURE**
  Proposed Part 830.5 (a)(3)

Understanding the potential significance of releases of internal turbine engine debris (other than out the exhaust path), our members' experience indicates that reporting of these events to NTSB would be difficult to implement and redundant to existing reporting schemes. With regard to implementation, escape of internal turbine engine debris other than via the exhaust path is relatively rare. Such events may include components exiting the engine intake, or the casing surrounding the compressor section. These events often result in debris exiting the engine in the path of the exhaust as well, making the exact failure mode difficult to define with certainty. To comply with the proposed requirement, carriers would have to report any and all turbine engine damage events to the NTSB, regardless of the path of exit or the circumstances of failure. Collection and reporting of this data beyond existing FAA reporting requirements would be resource-intensive, duplicative, and nonproductive.

The FAA, in its role as regulator, is provided with extensive turbine engine failure data in a timely manner through a process designed to examine it in context. Using the existing processes, the NTSB and FAA could work collaboratively to ensure that the data is used appropriately. Air carriers, regulators and the traveling public would benefit from this "systems safety" approach.

- **TRAFFIC COLLISION AVOIDANCE SYSTEM (TCAS) RESOLUTION ADVISORIES (RAs)**
  Proposed Part 830.5(d)

While supporting NTSB's goal to ensure that TCAS RAs representing hazardous occurrences are reported, reviewed and used to facilitate aviation safety measures, we recommend an alternative approach for capturing and analyzing this data.

We do not believe that the immediate and direct reporting of **all** Airborne Collision and Avoidance System ("ACAS"), specifically TCAS, RAs[2] would be beneficial to the NTSB. Based on our operational experience, participation in on-going safety data-sharing efforts, and longstanding commitment to accident prevention initiatives, we do not believe this overly broad reporting will achieve the desired goal. As discussed below, our experience demonstrates that most RAs do not indicate hazardous occurrences and are more of a technical function of current TCAS technology. If **all** TCAS RAs were reported to NTSB, the result would be a cluttered, unfiltered data pool of thousands of occurrences each month. Aside from the reporting, collection, and analytical difficulties in such a broad requirement, it is clear that the overwhelming majority of RAs do not "indicate a potential hazard in the air traffic control (ATC) system" as stated in the proposed rule and would offer no insight on possible safety measures. A more focused approach would result in more meaningful data and more potential benefit to the NTSB, airlines, and aviation safety.

Due to the significance of the proposed TCAS RA reporting requirement, we believe it would be helpful initially to describe our alternate approach for accomplishing NTSB's goals. Our recommended approach is followed by an overview of (1) current airline safety data exchange programs, including VASIP, (2) TCAS design and technology, and (3) TCAS RA reporting avenues. After demonstrating the need for more focused collection and examination of TCAS RA data, we further explain our recommendation and an implementation process.

Recommended Approach for TCAS RA Collection and Analysis:

Based on their extensive participation in multiple voluntary and mandatory event reporting schemes, ATA's members recommend an examination of these programs to determine how best to address NTSB's concerns. A coordinated approach will leverage years of expert analysis of TCAS occurrences and on-going TCAS reporting systems. These programs have demonstrated their value in enhancing the safety of the National Airspace System ("NAS").

Based on airline experience, as well as the support of participating industry stakeholders and regulatory experts, we recommend that the Voluntary Aviation Safety Information-Sharing Process ("VASIP") lead this effort. VASIP is a joint initiative by FAA and NASA to expand upon the information-sharing opportunities presented by burgeoning Aviation Safety Action Programs ("ASAPs") and Flight Operational Quality Assurance ("FOQA") programs. In a two-year demonstration, NASA Ames Laboratory at Moffett Field, California, will serve as the neutral "third party" agent of the national VASIP Executive Steering Committee ("ESC"), replicating the function of the extant FOQA/ASAP Aviation Rulemaking Committee ("ARC") ESC. Through a distributed architecture of servers located at designated carriers with FAA-approved ASAP and

[2] The proposal would apply to RAs issued when an aircraft is being operated on an instrument flight rules ("IFR") flight plan.

FOQA programs, de-identified data managed by the carriers and/or their data vendors will be extracted and aggregated in response to a query from NASA Ames. The VASIP ESC will examine and approve all proposals for data collection and subsequent analysis. Utilizing this process, a focused approach for the collection and analysis of "hazardous and/or significant" TCAS RA data could easily be developed and implemented.

As discussed in detail below, with the concurrence of the NTSB, the VASIP could make a TCAS RA risk determination, using current risk assessment methodology, including agreement on the definition of "hazardous and/or significant" TCAS events. In addition, VASIP could access the extensive studies on TCAS RAs and Traffic Advisories ("TAs") conducted by the industry and federal government, as well as resources of the FOQA program's newly created Data Aggregation Working Group ("DAWG") and FOQA/ASAP ARC. These existing programs, designed to share safety data and fully supported by the industry and federal regulators, would work together to develop a framework for review of those TCAS RAs that raise safety concerns.

Through participation in the VASIP, the NTSB would have the opportunity to develop the process and help guide follow-on efforts.

OVERVIEW

(1) Airline Participation in Current Safety Data-Sharing Programs, including VASIP

As noted, ATA and its member airlines fully support the NTSB's overarching safety objective in understanding the nature of TCAS occurrences and the need to identify potential "hot spots" that may exist in the NAS. Our members have gained considerable experience and insight over the past ten years by analyzing information supplied by ASAP and FOQA programs protected from disclosure under 14 CFR Part 193 and other procedural safeguards.[3] Efforts to promote the voluntary disclosure of flight data have proven their effectiveness in the development of sophisticated analytical tools. In addition, the success of industry/regulator collaborative efforts like the Radio Technical Commission for Aeronautics ("RTCA"), Inc., Commercial Aviation Safety Team ("CAST"), and the ASAP/FOQA Advisory Rulemaking Committee (ARC) -- including the ASAP/FOQA "Info Share" meetings sponsored by FAA's AFS-230 -- has resulted in the adoption of a collaborative, data-driven approach to information sharing.

The most recent culmination of these efforts is the creation of the VASIP, a collaborative, data-driven approach to information sharing. VASIP embraces the "systems safety"

[3] See also 49 USC Section 40123 that reads, in pertinent part, "Notwithstanding any other provision of law, ***neither*** the Administrator of the Federal Aviation Administration, nor any agency receiving information from the Administrator, ***shall*** disclose voluntarily-provided safety or security related information . . ." (emphasis added).

concept advocated by the FAA and the worldwide industry, and inherent in NTSB's approach to aviation safety. It provides an effective means to connect the current stovepipes that exist as airlines create ASAP and/or FOQA programs, and express the willingness to share their data "in a form and manner acceptable to the [FAA] Administrator." By design, VASIP could easily become the platform for a safety information sharing network that would support the multi-agency Joint Planning & Development Office ("JPDO") vision: to attain a consistently high level of aviation safety excellence, signified by elimination of fatal accidents, both nationally and internationally, by the year 2025.

Further, we recognize that TCAS is only slightly older than our current information-sharing systems and, although acknowledged to be *highly successful in mitigating a potential loss of separation*, the algorithms and aural alerts remain subject to continuous improvement by organizations like RTCA's Special Committee SC-147 as more reliable feedback is received and made actionable through the TCAS Transition Program ("TTP"). Safety experts at ATA and within our member airlines' safety departments have met with FAA and Aeronautical Radio, Inc. (ARINC) representatives to SC-147 as recently as October 2004 to discuss reported TCAS anomalies.

These continuing efforts to improve TCAS effectiveness demonstrate the airlines' commitment to collaborative safety data sharing efforts and improvement of TCAS technology. As discussed below, our experience indicates that the vast majority of TCAS RAs requires only minor flight path deviations and do not indicate an emergent situation. Many of our members routinely report what they believe to be *significant TCAS events* to ARINC through the protected reporting provisions of the TCAS Transition Program, to FAA through the ASAP, to NASA through the Aviation Safety Reporting System, and to NTSB. By all accounts, these existing, focused reporting schemes provide the framework to address NTSB's goal to use TCAS RA data to enhance aviation safety. As such, the proposed direct and immediate reporting of **all** TCAS RAs to NTSB is overly broad, duplicative, and unnecessary.

(2) TCAS Technology and Design

Versions

Two versions of TCAS are in use today. TCAS I provides traffic advisories ("TA") and proximity warning of nearby traffic to assist the pilot in the visual acquisition of intruder aircraft. TCAS I is mandated for use in the United States for turbine-powered, passenger-carrying aircraft having more than 10 and less than 31 seats. *TCAS I is also used by a number of general aviation fixed and rotary wing aircraft.* TCAS II provides traffic advisories and resolution advisories ("RA"), i.e., recommended escape maneuvers, in the vertical dimension to either increase or maintain the existing vertical separation between

aircraft. Airline aircraft, including regional aircraft with more than 30 seats *and general aviation turbine-powered aircraft* use TCAS II equipment.[4]

Since October 31st, 2003 turbine powered airplanes of more than 33,000 pounds maximum certificated takeoff weight operated under 14USC Parts 121, 125, or 129 are required to be equipped with TCAS II, or equivalent, and an appropriate Mode S transponder.[5]

After the mid-air collision between a German Air Force Tupolev 154 and a U.S. Air Force C-141 transport aircraft, off Namibia in September 1997, urgent consideration was given to the need to equip military transport aircraft with TCAS. *Several countries, including the United States, have initiated programs to equip tanker, transport and cargo aircraft within their military fleets with TCAS II.*[6]

If the intruder aircraft is transmitting on a Mode C (required by any aircraft operating in certain types of high-density airspace) or a Mode S transponder, or is equipped with TCAS I or II avionics as described above, *it is capable of generating a vertical RA in a commercial air carrier aircraft.*[7] Therefore, if the TCAS RA reporting requirement as proposed were adopted, commercial air carrier aircraft that are required in most instances to be dispatched and flown on an instrument clearance, *are highly susceptible to being compelled to report TCAS RA occurrences generated by another military or civil entity.* The result is even more complex sorting and reporting for the airlines and more unfiltered RA data that is not conducive to review and analysis.

Design

TCAS is designed to work autonomously of the aircraft navigation equipment and independent of the ground systems used to provide Air Traffic Control services. It provides a "solution" to a traffic conflict in the vertical plane only. The TCAS interrogates transponders of all (up to 30) aircraft in the vicinity and based on electronic replies received, tracks the slant range, altitude (if included in the reply) and bearing of surrounding traffic. From several successive replies, TCAS calculates a time to reach the closest point of approach (CPA) with the intruder.

TCAS can issue two types of alerts:

- **TA**s to assist the pilot in the visual search for the intruder aircraft and to prepare the pilot for a potential RA; and

[4] "Introduction to TCAS II, Version 7, U.S. Department of Transportation, Federal Aviation Administration, November 2000, page 5.
[5] TCAS Transition Program (TTP) Newsletter, Issue V7-3, FAA AIR-130, February 2002.
[6] "Introduction to TCAS II, Version 7, U.S. Department of Transportation, Federal Aviation Administration, November 2000, page 10.
[7] Ibid, Table 1, page 5.

- **RA**s to *recommend maneuvers that will either increase or maintain the existing vertical separation* from an intruder aircraft.[8]

TCAS is not designed to enforce compliance with an Air Traffic Control clearance, to police the ATC system, or to function as an arbitrary "measure of safety." TCAS is a last resort tool designed to prevent midair collisions between aircraft and is not the answer to all scenarios. FAA studies indicate that TCAS cannot preclude all collision risks and the system may, in certain circumstances, marginally induce an additional risk.[9]

TCAS II Version 7 is designed to filter out phenomena like "synchronous garble," avoid initiation of false surveillance tracks based on "multipath replies," and prevent interference with ATC radars or other radio services that operate in its band. To appreciate the complexity of TCAS, one must first understand that its logic system requires *a trade-off between necessary protection and unnecessary advisories.* Sensitivity Level (SL) determines the time thresholds for TA and RA issuance. For instance, when the aircraft is below 1,000 feet above ground level (e.g., in close proximity to a congested airport), SL2 will inhibit RAs and only TAs will be issued. Another important concept is protected volume. The dimensions of this protected airspace are determined by the time thresholds, which in turn are dependent upon closure rate and vertical speed. The Collision Avoidance System ("CAS") logic initiates and maintains a three-dimensional track of every contact, and can even discriminate that a target is effectively "on the ground" if one's own aircraft is below 1,750 feet AGL and CAS logic calculates a target to be below 360 feet AGL.[10]

Resolution Advisory Selection – a Two-Step Process

When an intruder is declared a threat, the RA "sense" (upward or downward) must first be determined. The CAS logic models the intruder's flight path from present position to CPA, then models upward and downward-sense RA's for one's own aircraft, ultimately choosing that which will provide greater vertical separation:

- Selecting a sense which will not cross through the intruder's altitude if the non-crossing sense will provide desired vertical separation, known as "ALIM."

The second step in selecting the RA is to choose the strength (least disruptive) of the advisory:

- First issuing a vertical speed limit (negative) RA to prevent two aircraft converging vertically with opposite rates from *reversing* vertical rate of each to avoid each other

[8] Ibid, page 7.
[9] Ibid, page 40.
[10] "Introduction to TCAS II, Version 7, U.S. Department of Transportation, Federal Aviation Administration, November 2000, page 27.

- Issuing a "preventive RA." *A preventive RA requires a pilot to maintain an existing vertical speed or avoid certain vertical speeds.*[11]
- Factoring in aircraft climb performance at high altitude, or in some flap/landing gear configurations, to bias sense selection.

"Typical" RA

The TCAS interface with pilots is provided by two displays – the traffic display and the RA display. The traffic display depicts the position of nearby traffic, relative to its own aircraft. In some installations, this is a dedicated, stand-alone display. In others, display of traffic information is "shared" on weather radar displays, map displays, Engine Indication and Crew Alerting System (EICAS) displays, or other multi-function displays.

Displays often feature the selection of multiple ranges, i.e.," zoom in" to reduce display clutter in high traffic density areas, and the ability to "zoom out" to display traffic at longer range and with greater altitude separation in cruise flight. One's own aircraft is depicted as a white or cyan arrowhead or airplane-like symbol. Other aircraft are depicted as follows:[12]

- An unfilled diamond (◇), shown in a different color than one's own aircraft is used to depict non-threat traffic.
- A filled diamond (◆), shown in a different color than one's own aircraft is used to depict proximate traffic.
- A filled amber or yellow circle (●) is used to display intruders that have caused a TA to be issued.
- A filled red square (■) is used to display intruders that have caused an RA to be issued.

Vertical speed and relative altitude information (in hundreds of feet above or below the symbol with plus or minus sign) are also provided *for all displayed traffic that is reporting altitude*. An up or down arrow shown directly to the right of the symbol will indicate whether the traffic is climbing or descending at more than 600 feet per minute.

A typical traffic depiction might show 

This would indicate an RA target 1,500 feet below one's own aircraft and climbing at more than 600 fpm.

Aural Annunciations

[11] FAA Advisory Circular 120-55A, "Air Carrier Operational Approval and Use of TCAS II," AFS-450, August 1993, page 5.
[12] "Introduction to TCAS II, Version 7, U.S. Department of Transportation, Federal Aviation. Administration, November 2000, page 13.

Whenever the TCAS collision avoidance logic issues a TA or RA, a voice alert is issued to ensure the pilots are aware of the information being displayed. These annunciations can be provided via a cockpit speaker or through the pilots' headsets. In TCAS II Version 7, there are 16 enhanced aural annunciations to guide the pilot in applying an appropriate amount of power and/or control input to resolve the traffic conflict. *TCAS is designed to select the RA strength that is least disruptive to the existing flight path, while still providing ALIM feet of separation.*[13] Aural annunciations are inhibited below 500 plus or minus 100 feet AGL.

Operational Experience Reporting in Previous TCAS Trials

The evaluation of TCAS II performance during its implementation has demonstrated that the equipment provides an overall improvement in flight safety. In reportedly dangerous situations, TAs have made visual acquisition of intruders possible in sufficient time to avoid any risk of collision. In some events, RAs have been issued that are believed to have prevented critical near midair collisions from taking place.

However, the operational experience has indicated that some issues related to TCAS continue to occur. As described by the FAA, these issues include the following:[14]

- Aircraft leveling off at 1,000 feet above or below conflicting traffic that is level may result in RAs being issued to the level aircraft.
- Altitude crossing clearances issued by a controller based on "maintain visual separation" may result in RAs being issued, particularly if one aircraft is level.
- High performance military aircraft performing "high G" maneuvers, and helicopters operating in the immediate vicinity of an airport, may result in advisories being issued against another aircraft.

In summary, TCAS should continue to be subject to expert evaluation and analysis to ensure its efficacy and improve reliability. This continuing need for examination demonstrates the value of assessing the risks presented by TCAS RAs in context and as part of a comprehensive overview of potential NAS hazardous occurrences.

(3) CURRENT TCAS RA REPORTING MECHANISMS

As demonstrated by years of operational experience and reporting, TCAS RAs are not, in and of themselves, evidence of hazardous situations or latent conditions that could lead to an accident. Out of context, they simply do not demonstrate the existence of a true safety risk. If a pilot or air controller believes a loss of acceptable separation resulted *for any reason at any time*, the FAA currently mandates the situation be reported via a Near Mid-Air Collision (NMAC) report. A TCAS RA may be one of several overt *manifestations* of

---

[13] Ibid, page 28.

[14] "Introduction to TCAS II, Version 7, U.S. Department of Transportation, Federal Aviation Administration, November 2000, page 38.

an underlying hazard, but misinterpretation of a spurious RA may lead to a mis-identification of a hazard and consequent inappropriate risk analysis.

The following mechanisms permit reporting of TCAS RAs and protect voluntarily reported, sensitive safety information from disclosure:

- **TCAS Transition Program**

A report may be made via the TCAS Transition Program ("TTP") to ARINC. It is treated with confidentiality under terms of the applicable TTP. ATA's cargo carriers, the most recent participants in U.S. TCAS and worldwide ACAS (Airborne Collision Avoidance System), make use of this dialog-enhanced reporting process as they gain confidence with TCAS because it affords them quick feedback from FAA and ARINC technical specialists whenever they encounter a situation they have not previously experienced. Misinterpretations that require modification of pilot training programs are quickly detected and acted upon.

- **Aviation Safety Action Program**

An ASAP report is the method utilized by the majority of ATA carriers that have mature TCAS implementation procedures (typically beyond five years). A single crew report will provide one viewpoint for analysis. The FAA representative on the ASAP Event Review Committee likely will seek corroborative information from ATC (radar and voice transmission data) to see the occurrence from a better vantage point. Ideally, if the "intruder" aircraft represents another air carrier with an FAA-approved ASAP, additional reports can be solicited. This collaboration is one wayVASIP could be utilized to great advantage to gain a holistic view of the circumstances.

- **NASA Aviation Safety Reporting System**

An ASRS report may be submitted to NASA by any flight crewmember, military or civilian.

Hypotheticals

As indicated, most RAs are innocuous, transient indications that represent either an isolated or occasionally recurring situation whose significance can only be appreciated by applying sampling and comparison techniques inherent in a sophisticated VASIP-like process. Several hypothetical scenarios describing the RA process and resolution are attached as Exhibit A to these comments.

It is clear that these scenarios do not demonstrate that a threat existed or was mishandled and/or presented a risk of collision. As such, immediate and direct notification of the resulting RAs to the NTSB was not warranted or potentially beneficial for analysis.

The above existing reporting mechanisms for hazardous occurrences, particularly FAA-approved reporting programs, are more appropriate and better designed to assimilate and use the data.

ATA RECOMMENDATION FOR REPORTING AND ANALYSIS OF RAs

In determining the most efficient way to address NTSB's concerns about TCAS RAs, ATA urges NTSB to consider that the FAA, airlines, and pilot associations have initiated a comprehensive, coordinated effort through the FOQA and ASAP Aviation Rulemaking Committee (ARC) to review TCAS RA events to identify issues for analysis and corrective action. Through the use of aggregate FOQA and ASAP data, TCAS system issues and geographic areas where RAs are more prevalent can be identified. Modifications to, or enhanced management of, the National Airspace System can be undertaken to lessen the likelihood of an RA.

To best utilize these on-going efforts and existing reporting mechanisms, ATA recommends that the VASIP, via its Executive Steering Committee, be charged with examining issues relating to TCAS RA collection and reporting, and after defining the hazard, establish threshold TCAS RA risk levels (based on probability of occurrence and outcome severity) in order to prioritize mitigation strategies and develop an action plan suitable to the FAA Administrator. In its coordination role, the VASIP will ensure that NTSB is afforded the opportunity to review and comment on the progress of the VASIP initiative.

The VASIP should adhere to generally-accepted precepts within the context of a Safety Management System, similar to those used successfully by the Commercial Aviation Safety Team:

- Identify the hazard and draft an accurate problem statement using a data-driven approach;
- Conduct a "risk analysis" (assess the probability of occurrence v. outcome severity) and subsequently assign some weighting factors that will facilitate prioritization;
- Identify a board range of plausible mitigation measures;
- Select a mitigation strategy well-suited to the degree of risk and cost/benefit, and develop a corresponding action plan;
- Continue to measure the effectiveness of the action plan by documenting results;
- Adjust the mitigation strategy based on the measurement metrics; and
- Quantify and report the results.

To conduct the risk assessment and explicitly define the hazard, the FAA's definition of a "Significant TCAS Event" may be a good starting point: [15]

[15] FAA Advisory Circular 120-55A, "Air Carrier Operational Approval and Use of TCAS II," AFS-450, August 1993, page 5

- A loss of standard ATC separation results from compliance with a TCAS-generated RA,
- TCAS is suspected of not performing as desired,
- A crewmember's use of the TCAS system appears to be improper, or
- An altitude excursion of more than 1,500 feet from an assigned level altitude occurs.

CONCLUSION

ATA and its members are anxious to work with the NTSB and other stakeholders to address NTSB's desire for a meaningful review of hazardous occurrences to enhance aviation safety. We support timely collection, investigation, and processes to recommend corrective action. As discussed in these comments, however, we urge NTSB to withdraw the portion of the NPRM requiring the reporting of certain internal turbine engine failures and **all** TCAS RAs.

We are particularly concerned about the proposed reporting of **all** TCAS RAs to NTSB as the resulting inflated data pool would present overwhelming analytical challenges. The VASIP, through use of industry experts and existing safety data reporting mechanisms and data-sharing programs, is the appropriate mechanism to promote effective collection and analysis. Use of this focused process will result in a meaningful data set, rather than a cluttered, unfiltered pool of thousands of RA occurrences -- data that will be extremely difficult and costly to collect and report, and even more difficult to analyze. As written, the proposed TCAS RA reporting requirement will lead to too much data and the risk of incomplete/inaccurate analysis. The aggregation of confidential-identified safety data is the only appropriate means to identify "hot spots" that will be investigated and use to fashion an improved mitigation strategy. We urge NTSB to withdraw this section of the NPRM and to endorse the described VASIP collaborative effort.

Again, ATA and its member airlines appreciate the opportunity to present these comments and would welcome the opportunity to meet with NTSB to answer questions and discuss our recommendations. Please contact me if the NTSB would like additional information or if I can be of any assistance.

Very respectfully,

for Mont Smith
Director, Safety
Air Transport Association

cc: Mr. John Delisi
Ms. Sandy Rowlett
Mr. Scott Dunham
Mr. Deepak Joshi

ATTACHMENT A

Hypothetical One

An EMS helicopter has responded at night to a highway traffic accident scene and is preparing to lift from a location near the final approach path for a busy sea level Metropolitan airport, and proceed to a local medical facility. Visual Meteorological Conditions (VMC) prevail with a 1,000' ceiling and 3 statute miles of visibility. The pilot of the helicopter, operating in Class B airspace on a VFR flight plan, activates his mode C transponder and calls the control tower to coordinate his movement. He needs to transition to forward flight into the wind in a direction that converges with the ILS final approach course, after which he will remain at or below 400' above ground level and turn away on a diverging course.

The tower is aware of the helicopter's presence because the helicopter was assigned a discreet transponder code inbound to the scene and the tower coordinated its entry into the Class B. The tower advises all commercial airline IFR inbound aircraft on final approach inside the outer marker of the helicopter's presence and intended flight profile. The closest commercial airline jet aircraft (approximately 4 miles out) reports the "field in sight" to tower and acknowledges the helicopter visually by strobe lights. The tower controller replies, "Altimont 33, maintain visual separation from the helicopter. Cleared to land, runway 14" and issues the helicopter the clearance "Altimeter 29.92. Cleared for takeoff. Execute an immediate right turn on course when safely airborne. Remain at or below 500 feet. Report clear of Class B airspace." Soon after, the same commercial jet aircraft on short final observes a contact on its cockpit TCAS indicator at 2 0'clock and approximately one-half mile, receives a Traffic Alert (TA), followed almost immediately by an aural alert "traffic, traffic" and a momentary aural RA annunciation "climb, climb." As the jet passes abeam, the helicopter fades off the TCAS screen. The jet continues on its stabilized approach path to a normal landing.

No evasive action is necessary, since the controller had accomplished suitable coordination and the RA was likely generated by the "solution" TCAS processed from the helicopter's initial takeoff vector. The airline pilots were startled by the TCAS RA annunciation, and they elect to file an ASAP report. Neither pilot feels the situation would require a Near Mid-Air Collision (NMAC) report.

Hypothetical Two

A commercial airline jet aircraft is on a right downwind visual approach to a landing on a parallel runway at a busy sea-level metropolitan airport in day VFR conditions (ceiling unlimited; visibility greater than 6 statute miles). Although filed on an IFR flight plan, the pilot has been "cleared for the visual approach to runway 25 right. Maintain visual separation from the Boeing on final approach to runway 25 left. Traffic permitting, expedite turn to final." The pilot of the first aircraft turns right onto a modified base leg at 2,500 feet msl, commences a descent at 1,200 feet per minute, and continues the turn to final. As he initiates the turn, he observes his traffic on the windscreen at 11 o'clock and 2 miles at an apparent altitude of 1,500 feet msl and descending toward runway 25L. As the turning and overtaking pilot steepens his angle of bank, the opposing aircraft remains at a constant relative angle off the nose and decreasing range. His TCAS issues an aural TA ("traffic, traffic") with this symbology followed almost immediately by an RA ("Adjust

Vertical Speed; Adjust". At no time has his aircraft crossed the extended centerline of runway 25R. The aircraft on approach to runway 25L observes the TCAS solution on his TCAS Indicator and has

received the RA "climb, crossing climb; climb, crossing climb." Unable to visually acquire the intruder aircraft behind him, and experiencing a destabilized approach, he executes a precautionary go-around on runway heading.

The tower controller will log the go-around and the pilot's supervisor will review the standard operating procedures for traffic flow and separation with the air controller shift. Note: In the future, if VASIP sees a trend of these undesirable events over time at a particular location, ATO's PDARS tracks can be analyzed for procedural improvements.

Hypothetical Three

A commercial jet aircraft (IFR flight plan) is on a visual approach in day VFR conditions (ceiling and visibility unlimited) to a sea-level hub airport surrounded by classified Department of Defense electronic warfare installations. At 800 feet msl and one mile from the airport, a TCAS aural RA announces "climb, climb." The First Officer consults the cockpit TCAS indicator and cannot locate a target that could be the source of the RA. Although there is considerable ground traffic in the Airport Movement Area, and several aircraft on departure at the opposite end of the airport moving rapidly away from their aircraft, the pilots cannot identify any immediate threat.

Since this type of false indication has happened on previous occasions in this vicinity, the pilots elect to continue their approach. The Captain subsequently reports the incident to his Chief Pilot via a company "Report of Unusual Incident" in the "other" category.

- Do these examples constitute a threat that was mishandled and presented a risk of collision? *No.*
- Is an "immediate notification" to the NTSB warranted or necessary? *No.*
- What more can be gained by interrupting scheduled air service, downloading radar or tower tapes, obtaining pilot-to-company operations reports, air traffic controller reports, and/or corroborative non-volatile memory data? *Very little.*
- Who should make this decision? *The FAA.*
- What criteria should they apply? *The submission of a Near Mid-Air Collision report or the report of substantial damage or injury currently required by NTSB 830.*